

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (previously presented): A printing method for printing an image onto a medium, the method comprising:

printing a correction pattern by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots, a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles, and a third one of the plurality of lines being formed with the first one of the plurality of nozzles;

obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line;

storing the correction values for the lines, respectively; and

printing the image with a plurality of the lines formed in the intersecting direction, while correcting the darkness of each line in accordance with the correction values each corresponding to the darkness of each of the measured lines;

wherein the correction values for the first one of the plurality of lines, the second one of the plurality of lines and the third one of the plurality of lines are stored respectively.

2. (original): A printing method according to claim 1, wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction.

3. (original): A printing method according to claim 2,
wherein a printing apparatus printing the image onto the medium,
includes a plurality of types of processing modes for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs;
prints, with at least two of the processing modes, a correction pattern corresponding to each of the processing modes on a medium, and has the correction values, which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line;
and

corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed.

4. (original): A printing method according to claim 3, wherein the correction pattern corresponding to each of the processing modes is printed to fit on a single medium.

5. (original): A printing method according to claim 1, wherein a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row.

6. (original): A printing method according to claim 5,
wherein a printing apparatus printing the image onto the medium comprises the nozzle row for each color of ink;

the correction value is prepared for each of the colors by printing the correction pattern for each of the colors; and

the darkness of the image is corrected color by color, based on the correction values for each of the colors.

7. (previously presented): A printing method according to claim 3, wherein the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, or an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium.

8. (original): A printing method according to claim 7, wherein the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion.

9. (original): A printing method according to claim 7, wherein the downstream edge processing mode and the upstream edge processing mode respectively include modes for printing an image provided with a margin at the edge portion.

10. (original): A printing method according to claim 7, wherein the correction pattern printed by the upstream edge processing mode is printed at the edge portion on the upstream side of the medium.

11. (original): A printing method according to claim 7, wherein the correction pattern printed by the downstream edge processing mode is printed at the edge portion on the downstream side of the medium.

12. (original): A printing method according to claim 7, wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium with respect to the intersecting direction.

13. (original): A printing method according to claim 12, wherein the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation.

14. (original): A printing method according to claim 1, wherein there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further downstream than the edge portion on the downstream side in the intersecting direction of the medium on which the image is printed; and

this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by line.

15. (original): A printing method according to claim 1, wherein ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction.

16. (original): A printing method according to claim 1,
wherein image data for printing the image is prepared, and the image data has a gradation value of the darkness for each dot formation unit formed on the medium;
if a correction value is not associated with the formation units,
then a creation ratio corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios, and

dots are formed in the formation units on the medium in accordance with the read creation ratio;
and

if a correction value is associated with the formation units,
then when reading the creation ratio corresponding to the gradation value from the
creation ratio table, the creation ratio corresponding to a value obtained by changing the
gradation value by the correction value is read, and dots are formed in the formation units on the
medium in accordance with the read creation ratio.

17. (original): A printing method according to claim 1,
wherein image data for printing the image is prepared, and the image data has a gradation
value of the darkness for each dot formation unit formed on the medium;

if a correction value is not associated with the formation units,
then a creation ratio corresponding to the gradation value of the formation units is read
from a creation ratio table in which gradation values are associated with dot creation ratios, and
dots are formed in the formation units on the medium in accordance with the read creation ratio;
and

if a correction value is associated with the formation units,
then a dot creation ratio corresponding to the gradation value of the formation unit is read
from a creation ratio table obtained by changing the creation ratio of the above-mentioned
creation ratio table by the correction value, and dots are formed in the formation units on the
medium in accordance with the read creation ratio.

18. (previously presented): A printing method according to claim 16, wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number.

19. (original): A printing method according to claim 1, wherein all lines in the correction pattern are printed based on the same gradation value.

20. (original): A printing method according to claim 19, wherein an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness; and

a correction ratio obtained by dividing a deviation between this target value and the darkness measurement value of each line by the target value is taken as the correction value.

21. (previously presented): A printing method according to claim 16, wherein the nozzles can form dots of a plurality of sizes; and the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table.

22. (original): A printing method according to claim 1, wherein a darkness of the correction pattern is measured optically using a darkness measurement device.

23. (original): A printing method according to claim 3, wherein the print processes in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another; and

the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot formation operation changes is different from one another.

24. (previously presented): A printing method for printing an image onto a medium, the method comprising:

printing a correction pattern by ejecting ink from a plurality of nozzles moving in a predetermined movement direction and forming, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots, a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles, and a third one of the plurality of lines being formed with the first one of the plurality of nozzles;

obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line;

storing the correction values for the lines, respectively; and

printing the image with a plurality of the lines formed in the intersecting direction, while correcting the darkness of each line in accordance with the correction values each corresponding to the darkness of each of the measured lines;

wherein the correction values for the first one of the plurality of lines, the second one of the plurality of lines and the third one of the plurality of lines are stored respectively;

wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction;

a printing apparatus printing the image onto the medium,

includes a plurality of types of processing modes for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs;

prints, with at least two of the processing modes, a correction pattern corresponding to each of the processing modes on a medium, and has the correction values, which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line; and

corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed;

the correction pattern corresponding to each of the processing modes is printed to fit on a single medium;

a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row;

a printing apparatus printing the image onto the medium comprises the nozzle row for each color of ink, the correction value is prepared for each of the colors by printing the correction pattern for each of the colors, and the darkness of the image is corrected color by color, based on the correction values for each of the colors;

the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, or an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium;

the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion;

the correction pattern printed by the upstream edge processing mode is printed at the edge portion on the upstream side of the medium;

the correction pattern printed by the downstream edge processing mode is printed at the edge portion on the downstream side of the medium;

the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium with respect to the intersecting direction;

the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation;

there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further downstream than the edge portion on the downstream side in the intersecting direction of the medium on which the image is printed; and

this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by line;

ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction;

image data for printing the image is prepared, and the image data has a gradation value of the darkness for each dot formation unit formed on the medium;

if a correction value is not associated with the formation units, then a creation ratio corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios, and dots are formed in the formation units on the medium in accordance with the read creation ratio; and

if a correction value is associated with the formation units, then when reading the creation ratio corresponding to the gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read, and dots are formed in the formation units on the medium in accordance with the read creation ratio;

the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number;

all lines in the correction pattern are printed based on the same gradation value;

an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness; and

a correction ratio obtained by dividing a deviation between this target value and the darkness measurement value of each line by the target value is taken as the correction value;

the nozzles can form dots of a plurality of sizes, and

the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table;

a darkness of the correction pattern is measured optically using a darkness measurement device;

the print processes in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another; and

the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot formation operation changes is different from one another.

25. (previously presented): A printing apparatus printing an image onto a medium, comprising:

nozzles for ejecting ink; and

a controller for making a plurality of the nozzles that move in a predetermined movement direction eject ink to form, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots, a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles, and a third one of the plurality of lines being formed with the first one of the plurality of nozzles, to print a correction pattern, the controller obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line, the controller storing the correction values for the lines, respectively, the controller printing the image with a plurality

of the lines formed in the intersecting direction, while correcting a darkness of each of the lines in accordance with the correction values each corresponding to a darkness of each line in the correction pattern, wherein the correction values for the first one of the plurality of lines, the second one of the plurality of lines and the third one of the plurality of lines are stored respectively.

26. (previously presented): A printing system, comprising:

- a computer; and
- a printing apparatus connected communicably to the computer; the printing apparatus including:
 - nozzles for ejecting ink; and
 - a controller for making a plurality of the nozzles that move in a predetermined movement direction eject ink to form, in an intersecting direction intersecting the movement direction, a plurality of lines extending along the movement direction and constituted by a plurality of dots, a first one of the plurality of lines formed with a first one of the plurality of nozzles being adjacent to a second one of the plurality of lines formed with a second one of the plurality of nozzles, and a third one of the plurality of lines being formed with the first one of the plurality of nozzles, to print a correction pattern, the controller obtaining correction values that respectively correspond to the lines by measuring a darkness of the correction pattern line by line, the controller storing the correction values for the lines, respectively, the controller printing the image with a plurality of the lines formed in the intersecting direction, while correcting a darkness of each of the lines

in accordance with the correction values each corresponding to a darkness of each line in the correction pattern, wherein the correction values for the first one of the plurality of lines, the second one of the plurality of lines and the third one of the plurality of lines are stored respectively.

27. (canceled).

28. (previously presented): A printing method according to claim 17, wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number.

29. (previously presented): A printing method according to claim 17, wherein the nozzles can form dots of a plurality of sizes; and the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table.

30. (previously presented): A printing method according to claim 1, wherein the correction value for the first one of the plurality of lines is different from the correction value for the third one of the plurality of lines.

31. (new): A printing apparatus according to claim 25, wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction;

wherein the printing apparatus:

includes a plurality of types of processing modes for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs;

prints, with at least two of the processing modes, a correction pattern corresponding to each of the processing modes on a medium, and has the correction values, which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line; and

corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed;

wherein the correction pattern corresponding to each of the processing modes is printed to fit on a single medium;

wherein a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row;

wherein the printing apparatus comprises the nozzle row for each color of ink, the correction value is prepared for each of the colors by printing the correction pattern for each of

the colors, and the darkness of the image is corrected color by color, based on the correction values for each of the colors;

wherein the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, or an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium;

wherein the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion;

wherein the correction pattern printed by the upstream edge processing mode is printed at the edge portion on the upstream side of the medium;

wherein the correction pattern printed by the downstream edge processing mode is printed at the edge portion on the downstream side of the medium;

wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium with respect to the intersecting direction;

wherein the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation;

wherein there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further

downstream than the edge portion on the downstream side in the intersecting direction of the medium on which the image is printed;

wherein this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by line;

wherein ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction;

wherein image data for printing the image is prepared, and the image data has a gradation value of the darkness for each dot formation unit formed on the medium;

wherein if a correction value is not associated with the formation units, then a creation ratio corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios, and dots are formed in the formation units on the medium in accordance with the read creation ratio;

wherein if a correction value is associated with the formation units, then when reading the creation ratio corresponding to the gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read, and dots are formed in the formation units on the medium in accordance with the read creation ratio;

wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number;

wherein all lines in the correction pattern are printed based on the same gradation value;

wherein an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness;

wherein a correction ratio obtained by dividing a deviation between this target value and the darkness measurement value of each line by the target value is taken as the correction value;

wherein the nozzles can form dots of a plurality of sizes;

wherein the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table;

wherein a darkness of the correction pattern is measured optically using a darkness measurement device;

wherein the print processes in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another; and

the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot formation operation changes is different from one another.

32. (new): A printing system according to claim 26, wherein a plurality of the lines are formed in the intersecting direction by repeating in alternation a dot formation operation of forming dots on the medium by ejecting ink from a plurality of the nozzles moving in the movement direction and a carrying operation of carrying the medium in the intersecting direction;

wherein the printing apparatus:

includes a plurality of types of processing modes for respectively executing print processes in which at least one of the carrying operation and the dot formation operation differs;

prints, with at least two of the processing modes, a correction pattern corresponding to each of the processing modes on a medium, and has the correction values, which are obtained by measuring the darkness of the correction pattern line by line, in correspondence with each line; and

corrects the darkness of the image line by line, in accordance with the correction values corresponding to each line of the image, when printing the image in any of the processing modes with which the correction pattern was printed;

wherein the correction pattern corresponding to each of the processing modes is printed to fit on a single medium;

wherein a plurality of the nozzles is lined up along the intersecting direction to constitute a nozzle row;

wherein the printing apparatus comprises the nozzle row for each color of ink, the correction value is prepared for each of the colors by printing the correction pattern for each of

the colors, and the darkness of the image is corrected color by color, based on the correction values for each of the colors;

wherein the at least two processing modes include at least either a downstream edge processing mode for printing an image at an edge portion on a downstream side, with respect to the intersecting direction, of the medium, or an upstream edge processing mode for printing an image at an edge portion on an upstream side, with respect to the intersecting direction, of the medium;

wherein the downstream edge processing mode and the upstream edge processing mode respectively are modes for printing an image provided without a margin at the edge portion;

wherein the correction pattern printed by the upstream edge processing mode is printed at the edge portion on the upstream side of the medium;

wherein the correction pattern printed by the downstream edge processing mode is printed at the edge portion on the downstream side of the medium;

wherein the at least two processing modes include an intermediate processing mode for printing an image on a portion between the edge portion on the upstream side of the medium and the edge portion on the downstream side of the medium with respect to the intersecting direction;

wherein the intermediate processing mode and at least one of the downstream edge processing mode and the upstream edge processing mode have a different carry amount in the carrying operation;

wherein there is also a correction value for a region that is judged to be further upstream than the edge portion on the upstream side, or for a region that is judged to be further

downstream than the edge portion on the downstream side in the intersecting direction of the medium on which the image is printed;

wherein this correction value is obtained by arranging the medium at a position corresponding to the region, printing the correction pattern on this medium, and measuring the darkness of this correction pattern line by line;

wherein ruled lines extending along the movement direction for specifying a line during the measurement when measuring the darkness of the correction pattern line by line are formed in the correction pattern at a predetermined spacing in the intersecting direction;

wherein image data for printing the image is prepared, and the image data has a gradation value of the darkness for each dot formation unit formed on the medium;

wherein if a correction value is not associated with the formation units, then a creation ratio corresponding to the gradation value of the formation units is read from a creation ratio table in which gradation values are associated with dot creation ratios, and dots are formed in the formation units on the medium in accordance with the read creation ratio;

wherein if a correction value is associated with the formation units, then when reading the creation ratio corresponding to the gradation value from the creation ratio table, the creation ratio corresponding to a value obtained by changing the gradation value by the correction value is read, and dots are formed in the formation units on the medium in accordance with the read creation ratio;

wherein the dot creation ratio indicates a proportion of a number of dots formed inside a region that has a uniform gradation value and that is provided with a predetermined number of the formation units, to that predetermined number;

wherein all lines in the correction pattern are printed based on the same gradation value;

wherein an average value, across all lines, of darkness measurement values measured line by line is taken as a target value of darkness;

wherein a correction ratio obtained by dividing a deviation between this target value and the darkness measurement value of each line by the target value is taken as the correction value;

wherein the nozzles can form dots of a plurality of sizes;

wherein the relation between the creation ratios and the gradation values is given for each of the sizes in the creation ratio table;

wherein a darkness of the correction pattern is measured optically using a darkness measurement device;

wherein the print processes in which the carrying operation differs from one another are print processes in which the pattern according to which the carry amount of each carrying operation changes is different from one another; and

the print processes in which the dot formation operation differs from one another are print processes in which the pattern according to which the nozzles that is used in each dot formation operation changes is different from one another.